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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 25791.157.02	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/38550	International filing date (day/month/year) 04 December 2003 (04.12.2003)	Priority date (day/month/year) 05 December 2002 (05.12.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): E21B 43/10, 28/00, 29/10 and US Cl.: 166/207, 380, 177.6		
Applicant ENVENTURE GLOBAL TECHNOLOGY		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
These annexes consist of a total of 32 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 14 June 2004 (14.06.2004)	Date of completion of this report 02 May 2005 (02.05.2005)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer David Bagnell <i>David Bagnell</i> Telephone No. N/A

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/US03/38550

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description:
 pages 1-18 as originally filed
 pages NONE filed with the demand
 pages NONE filed with the letter of _____
- ☒ the claims:
 pages NONE as originally filed
 pages NONE as amended (together with any statement) under Article 19
 pages NONE filed with the demand
 pages 19-50 filed with the letter of 10 February 2005 (10.02.2005)
- ☒ the drawings.
 pages 1-11 as originally filed
 pages NONE filed with the demand
 pages NONE filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages NONE as originally filed
 pages NONE filed with the demand
 pages NONE filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages None
- ☒ the claims, Nos. 3, 32, and 65
- ☒ the drawings, sheets/~~fig~~ None

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).
 ** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)

Claims 1-182 YES
Claims None NO

Inventive Step (IS)

Claims 1-182 YES
Claims None NO

Industrial Applicability (IA)

Claims 1-182 YES
Claims None NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

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VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 15-182 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: claim numbers 15 and 16 are used twice in succession, which leads to the numbering of the rest of the claims to be improper.

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

V. 2. Citations and Explanations:

Claims 1-101 and 103-110 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device and an actuator coupled to the expansion cone for displacing the expansion device, as is currently claimed.

Claim 102 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a means for radially expanding a tubular with a means for reducing the required radial expansion forces, as is currently claimed.

Claims 111-118 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the expansion device has one or more external arcuate spherical, elliptical, hyperbolic, or faceted surfaces, as is currently claimed.

Claims 119, 120, 135, 138, 139, 178, 180, and 182 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the expansion device is a rotary expansion device and vibratory energy is injected into the expansion device to impart rotation to the expansion device, as is currently claimed.

Claims 121-124, 136, 137, and 149-151 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the vibratory device is located within an expanded portion of the tubular to inject vibratory energy from a location within the expansion device, as is currently claimed.

Claims 125, 126, 152, and 153 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein there are a plurality of vibratory devices for injecting vibratory energy from a plurality of locations, as is currently claimed.

Claims 127-130, 154-156, 162-164, 170-172, 177, 179, and 181 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the vibratory energy has a frequency distribution having a plurality of center frequencies and the vibratory energy is in a plurality of planes, as is currently claimed.

Claims 131-134, 157, 158, 165, 166, 173, and 174 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the plane of vibratory energy is variable or wherein the center of frequency is about 40Hz, as is currently claimed.

Claims 140-143 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method and system for radially expanding and plastically deforming a tubular wherein the plasticity and formability of the tubular is increased prior to expansion, as is currently claimed.

Claims 144-147 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method and system for radially expanding and plastically deforming a tubular by injecting vibratory energy and, during expansion, incrementing at least one of the plane, center frequency, and amplitude for the injected vibratory energy and monitoring the amount of energy required, as is currently claimed.

Claim 148 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the expansion device has a locking device coupled to an actuator for fixing the position of the tubular relative to the expansion device, as is currently claimed.

Claims 159, 160, 167, 168, 175, and 176 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an expansion device with a vibratory device wherein the expandable tubular is a wellbore casing or a pipeline, as is currently claimed.

Form PCT/IPEA/409 (Continuation Sheet) (July 1998)

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Claims 161 and 169 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest radially expanding a tubular with an expansion device and a vibratory device wherein the vibratory energy is injected by injecting fluidic materials into the tubular, as is currently claimed.

Claims 1-182 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.